

# LESSON 2: INTRODUCTION TO TOPOGRAPHICAL MAPS

## PURPOSE

This lesson presents an overview of topographic maps. It describes their characteristics and examines the marginal information, symbols, and colors used on them. The remainder of this chapter will focus on the use of topographic maps.



<i>bench marks</i>	<i>nautical</i>
<i>declination</i>	<i>miles</i>
<i>grid</i>	<i>orienteering</i>
<i>grid north</i>	<i>statute miles</i>
<i>grid zone</i>	<i>true north</i>
<i>magnetic north</i>	

## INTRODUCTION

Compared to road maps, topographic maps show more detail of an area's natural features. Because of its detail, especially of terrain features, elevation, and relief, the military prefers this type of map.

After you have mastered the basics of map reading in this chapter, you will most likely have the opportunity to demonstrate your knowledge of these skills during outdoor practical exercises. Whether you are practicing basic land navigation techniques, participating in **orienteering**, or performing land navigation at summer camp, knowing how to use topographic maps can help you in the following ways:

Finding your way if you become separated from a group.

- Successfully, and safely, navigating a group, especially during cross-country movements.
- Determining distances from one location to another.
- Pinpointing locations in a given area.
- Determining the type of terrain in which you or your unit must operate.
- Planning trips or operations.

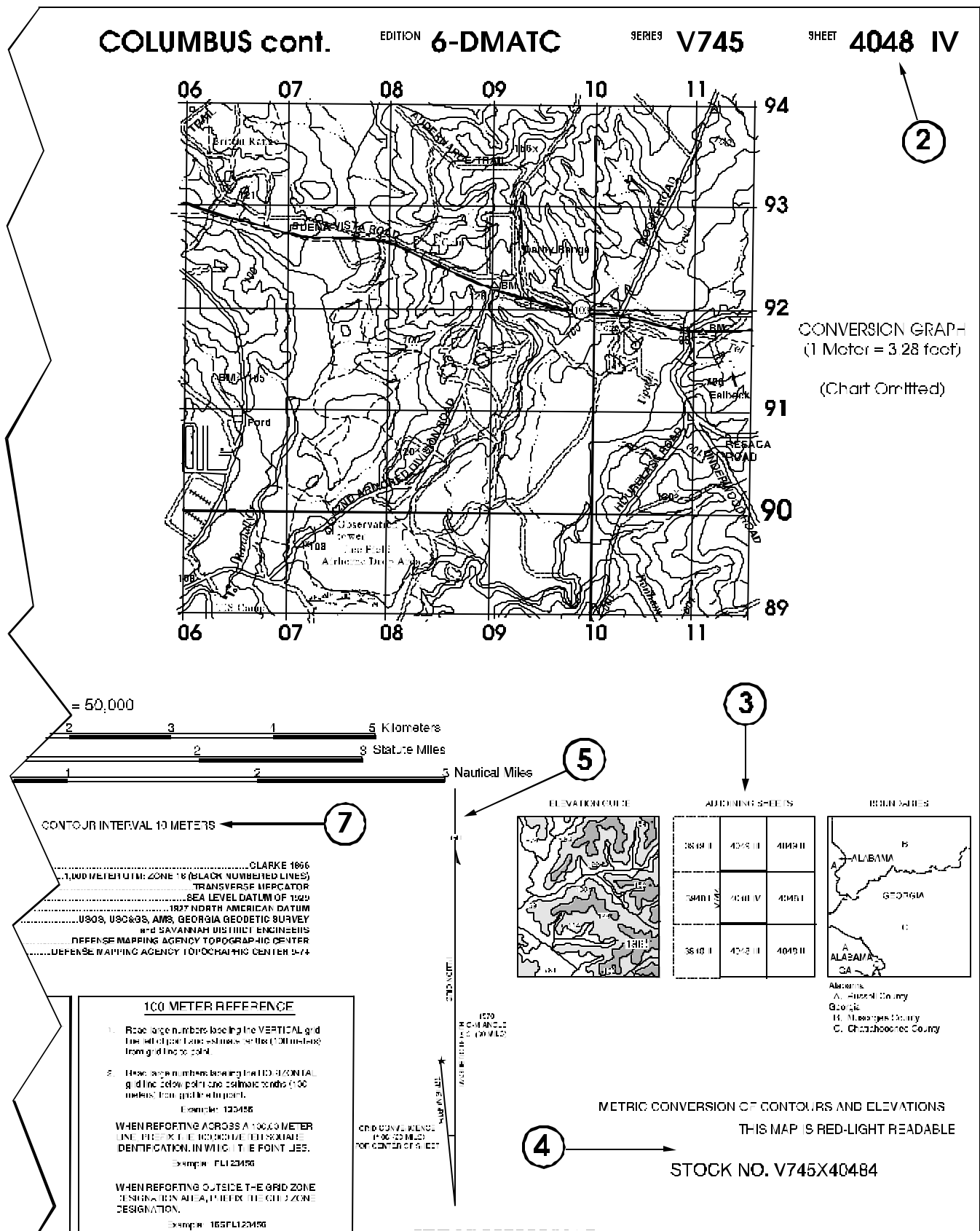
## MARGINAL INFORMATION

The marginal information for topographic maps varies significantly from that of road maps. One major difference is that the marginal information on topographic maps is more standardized than that on other maps. However, all topographic maps are not the same. Consequently, you must examine this information carefully before using each map. This lesson identifies ten items of marginal information that you will need to know when using a topographic map in the remainder of this unit. We will discuss more of these items in subsequent lessons in this chapter.

The topographic map shown on the next two pages (Illustration 2.2.1) is only an extract of how one actually appears; there are three major differences. First, the mapped area and bar scales are drawn to scale, but the extract represents only a small portion of the actual map. Second, we have provided call-outs to help you locate the ten items of marginal information that are described following the map, but we intentionally excluded some of the marginal information. Finally, this map indicates the position of the legend (call-out #10), but Illustration 2.2.2 presents it in more detail.



Illustration 2.2.1



1. Sheet Name. You can locate the sheet name at the center of the top margin. As with road maps, mapmakers generally title a map after its prominent cultural or geographic feature.

2. Sheet Number. You can find the sheet number located in either the upper right or the lower left corners. Use it as a reference number for the map sheet.

3. Adjoining Map Sheets Diagram. Locate the adjoining (or adjacent) map sheets diagram in the right corner of the lower margin. This diagram contains nine squares; the center square is the map sheet at which you are looking. The remaining squares show the sheet numbers for those maps at the same scale that surround the area covered by the center square.

4. Special Notes. Special notes are statements of general information that relate to the mapped area; for example: the map is red-light readable (located in the lower right corner) or a lane is generally considered as being a minimum of 2.5 meters (located in the lower left corner).

5. Declination Diagram. Another item of information located in the lower right margin is the **declination** diagram. All you need to know at this time is that it indicates the direction and relationship of **true**, **magnetic**, and **grid north**. You will receive instruction on how to use this diagram in LET 2.

6. Scales. Locate the graphic (bar) scales in the center of the lower margin of the map. Compare the differences between these scales and those found on road maps.

⇒ We express a map scale as a representative fraction, which gives the ratio of map distance to ground distance. For example, the scale note 1:50,000 indicates that one unit of measure on the map equals 50,000 units of the same measure on the ground.

⇒ Most topographic maps have more than one scale, each using a different unit of measurement. The most common units of measurement are miles (**statute** and **nautical**), meters/kilometers, and yards.

⇒ Mapmakers divide each scale into two parts: an extension scale and a primary scale. Use the primary scale, located to the right of the zero, to measure full units of measurement. Use the extension scale, located to the left of the zero, to measure tenths of a unit. Read the extension scale right to left from the zero and the primary scale left to right from the zero. (See Illustration 1.)

7. Contour Interval Note. The contour interval note also appears in the center of the lower margin. It represents the vertical distance between contour lines on the map.

8. Grid Reference Box. Located at the bottom center of the lower margin, the **grid** reference box contains information for identifying the **grid zone** and the 100,000 meter square representing the area. It also provides instructions for giving grid references on the map. The next two chapters present information on grid referencing systems and the usefulness of the grid reference box.

9. Unit Imprint. You can find the unit imprint below the left corner of the mapped area. It identifies the agency that prepared and printed the map.

10. Legend. The legend appears below the unit imprint. It states the effective date of the road and other data and illustrates the symbols used on the map. Shown on the next page is an example of a legend.

## LEGEND

### ROAD DATA 1973-OTHER INFORMATION 1973

ON THIS MAP, A LANE IS GENERALLY CONSIDERED AS BEING A MINIMUM OF 2.5 METERS (8 FEET) IN WIDTH.  
IN DEVELOPED AREAS, ONLY THROUGH ROADS ARE CLASSIFIED.  
TINT INDICATES AREAS IN WHICH ONLY LANDMARK BUILDINGS ARE SHOWN.

<b>ROADS</b>	
Primary:	
All-weather, hard surface, divided highway, with median strip	
All-weather, hard surface, two or more lanes wide	
Secondary:	
All-weather, hard surface, two or more lanes wide	
Light duty all-weather, hard or improved surface	
Poor or dry-weather, unimproved surface	
Trail	
Route markers: Interstate, Federal, State	
Railroads: Standard gauge (1.41m./4'9 1/2")	
Single track	
Multiple track	
Multiple track non-operating	
Railroad station (position known, unknown)	
Cemeteries	
<b>BOUNDARIES</b>	
National	
State (with monument)	
County	
Corporate limits	
Military reservation	
Other reservation	
Level	
Fence	
Power transmission line	
Buildings or structures	
Church, school	
Windmill, wind pump, Watermill	
Mines: Horizontal shaft; Vertical shaft	
Open pit mine or quarry	
Horizontal control station	
Bench mark, monumented	
Bench mark, non-monumented	
Spot elevations in meters: Checked; Unclassified	
Woodland, Scrub	
Vineyard, Orchard	
Intermittent lake	
Intermittent stream, Dam	
Marsh or swamp	
Deposits: Fills	
Large rapids; Large falls	

*Illustration 2.2.2*

## MAP SYMBOLS

As in the previous lesson on road maps, topographic maps use symbols to represent the position and shape of features as viewed from above. The legend explains the meanings for the symbols used on a topographic map.

Map symbols on topographic maps are generally in more detail than on other maps. For example, these maps include unimproved roads and trails, different gauges of railroad tracks, power lines, mines or quarries, **bench marks**, and spot elevations. However, the symbols are not always the same on every map. Always refer to the legend to avoid errors when reading a map.

## MAP COLORS

The five colors described in the previous lesson (black, blue, brown, green, and

red) and the features they represent are also used on topographic maps. In addition, topographic maps use two colors that are usually not found on other maps. These two colors are:

- **White:** Identifies an area void of vegetation.
- **Reddish-brown:** Identifies man-made and relief features and elevation (for example, contour lines on red-light readable maps). (**Note:** Brown also identifies relief features and may indicate elevation, or contour lines, on older maps.)

If other colors appear on a topographic map, the marginal information must contain an explanation of their use.

## CONCLUSION

The topographic map is the one most commonly preferred by the military because of its detail in portraying terrain features, landforms, the horizontal positions of these features, and elevation/relief. Road maps and topographic maps differ in their marginal information, layout, and scales. However, your ability to read road maps will help you to read topographic maps as well.

\* \* \*